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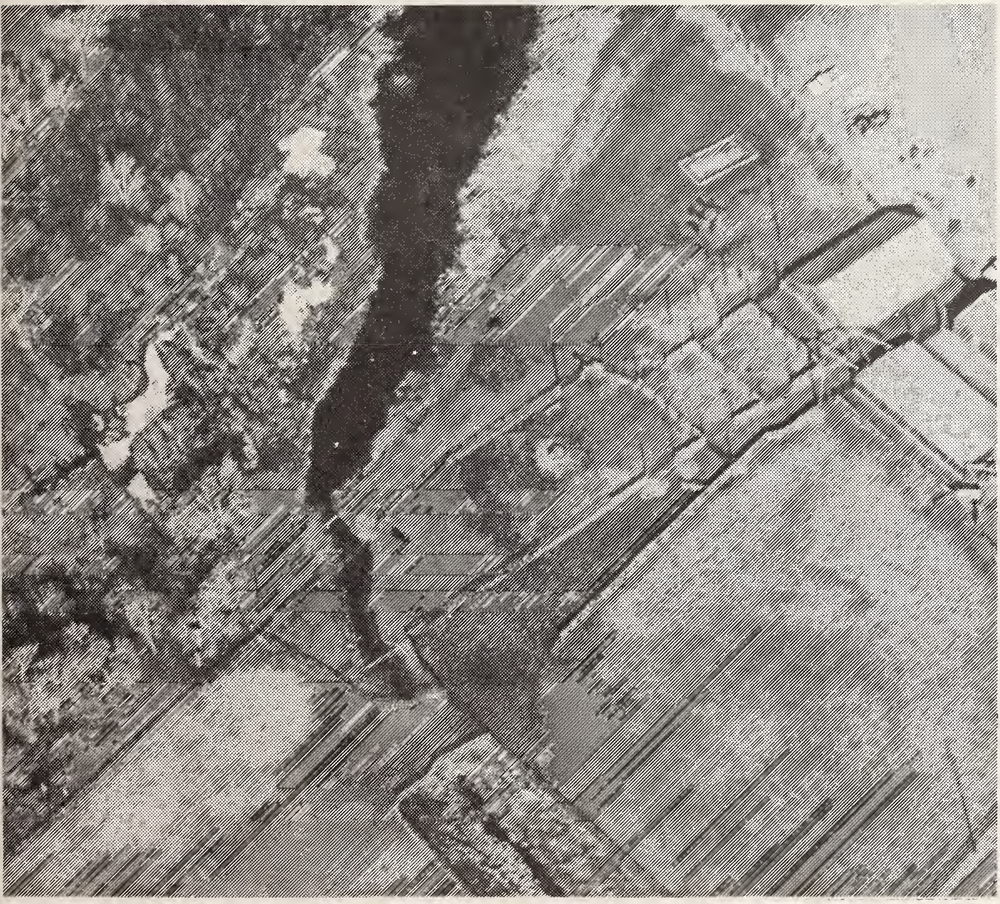
OMMON SENSE
AND WATER QUALITY

A HANDBOOK FOR
LIVESTOCK PRODUCERS



Air photo of a typical Montana ranch, near Simms.

Water Quality Division
Montana Department of Health
and Environmental Sciences
1994

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About this publication

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PREFACE

This handbook is designed to provide guidance to livestock producers and other agricultural interests in Montana on the regulation of animal confinement areas and potential impacts on state waters. This is a **guidance** document only and is not intended to address all situations concerning potential impacts to state waters.

Since potential impact to state waters from any operation is extremely site-specific, this handbook will attempt to outline some of the general conditions associated with many operations as they relate to water quality problems. Some examples of Water Quality Protection Practices (WQPPs) are provided which may be used to minimize impacts to state waters. The WQPPs described are not all-inclusive. Agriculture is a changing field with WQPPs being developed as time passes. It is not our intention to micromanage your operation but to equip you with the knowledge necessary to insure compliance with the applicable laws and regulations. As the Montana Water Quality Act says: "It is the public policy of this state to conserve water by protecting, maintaining, and improving water quality for beneficial uses."

You'll need to know some definitions and acronyms to get the most out of this handbook. Take a quick look at them now so you'll know where to look to check a term used in the written text.

DEFINITIONS

ACT (MWQA)	Title 75, Chapter 5, MCA, Montana Water Quality Act
CAFO	A Concentrated Animal Feeding Operation as defined in federal law by 40 CFR, Part 122, Appendix B. A CAFO is a point source **requiring a discharge permit.** Any operation may be designated a CAFO upon inspection by the department typically based on condition of vegetation, condition of ground surface, slope, soils, proximity to state waters, number of animals and duration of confinement. *(see inside back cover)*
CAFO-GENERAL DISCHARGE PERMIT	Formerly called the feedlot permit. Application for authorization to discharge under this permit addresses both MPDES and MGWPCS requirements.

DEPARTMENT	Montana Department of Health and Environmental Sciences. Sometimes abbreviated as MDHES.
DISCHARGE	To release, pour, emit, or deliver.
GROUND WATER	Water under the ground surface consisting of surface water that has seeped down. The source of water in wells and springs and may fluctuate with the season. Ground water may be protected from nearby surface activities (pollutants) when separated by a confining layer or may be vulnerable to pollutants when found in coarse, porous or alluvial materials.
INFILTRATION	The movement of surface water into the ground. For example, when rain water passes though manure, polluted water may infiltrate the soil and contaminate ground water.
MPDES	Montana Pollutant Discharge Elimination System. Authorization to discharge under a MPDES general permit is typically required for CAFOs; however, an individual MPDES permit may be required for some operations.
MGWPCS	Montana Ground Water Pollution Control System. Authorization to discharge under a MGWPCS general permit may be issued for CAFOs; however, an individual MGWPCS permit may be required for some operations.

POINT SOURCE	A discernible, confined, and discrete conveyance including any pipe, ditch, channel or conduit from which pollutants may be discharged.
POLLUTION	Contamination or other alteration of the properties of state waters which exceeds the Montana Water Quality Standards. The discharge, seepage, drainage, infiltration or flow of any substance into state waters which may render the waters harmful or detrimental to public health, recreation, livestock, or wildlife. For example, rainwater may become polluted by allowing it to pass through manure before it enters surface or ground water. Another example of pollution may be the trampling of streambanks that causes or allows erosion of sediments into state waters. A discharge, seepage, infiltration or flow which is authorized under the pollution discharge rules is not considered pollution.
PROCESS WASTE WATER	Any wastewater or precipitation (rain or snow) which comes into contact with any manure, litter, bedding, or any material used or resulting from animals or poultry.
STATE WATERS	Any body of water, irrigation system, or drainage system, either **surface** or **underground** except for an irrigation

	system where water is used up within the system and not returned to state waters. **Water rights convey a right to use but not to alter state waters.**
SURFACE WATER	Water on the ground surface such as a stream, river, lake, pond, slough, wetland, irrigation ditch, return ditch, constructed drain.
WASTES	Sewage, manure, bedding, decayed wood, sawdust, shavings, bark, sand, chemicals, sediment, discarded equipment, or any substances that may pollute state waters.
WATER QUALITY PROTECTION PRACTICES (WQPPs)	Activities, maintenance, procedures, or management practices designed to maintain and improve the quality of state waters. May include operating procedures, practices or structures to utilize wastes or control run-off, waste disposal, or drainage.

WHY PROTECT WATER QUALITY?

Agriculture has made a significant contribution to the Montana economy since the 1860s. Historically, livestock operations were located along streams due to the available feed, shelter and drinking water. Many of the original livestock operations still exist today in addition to those that have been developed more recently. The relatively sparse population of Montana put limited demand on the available clean water, but times have changed. Livestock producers and the agricultural community need clean water in sufficient quantity to support their operations. Other demands for clean water have increased due to population dynamics and the development of other industries and user groups. As demand increases for a limited water supply, it is apparent we must maintain the quality of the available water. The Clean Water Act and Montana Water Quality Act were adopted in the 1970s to maintain and improve water quality for beneficial uses. Regulations continue to be modified and amended to clarify the responsibilities of operations which cause pollution through their business. Over the past 25 years, many industries and water users have been influenced by this legislation. Regulatory attention has been focused on municipal and industrial dischargers, but now attention is beginning to include livestock and agricultural producers.

A "head in the sand" response to the changing field of farm and ranch management is not recommended. Producers must address potential problems associated with their activities or face the consequences of increased regulation and enforcement.

A wide variety of water-related problems can be caused by your farm and ranch management activities. Some of these may not be apparent to you or perhaps weren't much of a concern in the past. For example, stream bank trampling often leads to a widening of the stream channel, higher water temperatures, increased evaporation, faster run-off, and possibly a lowering of the adjacent water table. None of these changes may specifically concern you or be an obvious problem to you and therefore may go unnoticed.

Runoff or infiltration of rain water from livestock operations and thoughtless manure handling practices can result in:

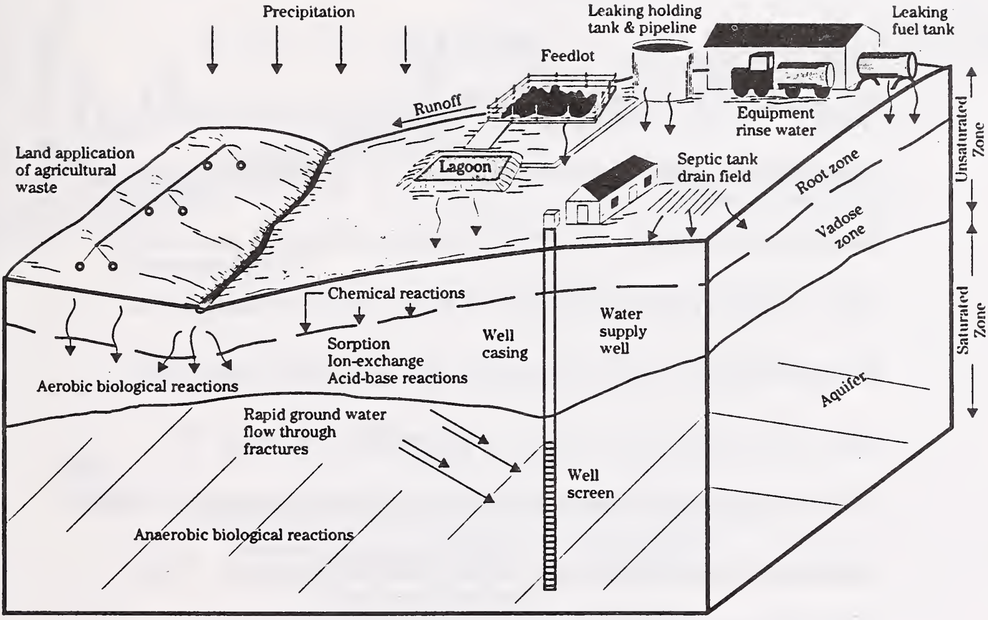
clogged irrigation systems
increased flood potential
channel instability
nutrient loading
reduced fish populations
increased erosion
high water treatment cost
sedimentation

contaminated wells polluted lakes and streams

unwanted aquatic vegetation

Some of these changes can be easily seen. For example, sometimes we wonder about excessive green algae growth in streams below a confinement area or irrigation return ditch which may caused by too much nitrogen.

The impact of pollution on ground water is less obvious but may be more significant because "bioremediation" is lacking. For example, the biological organisms of surface water systems, such as streams, along with climatic factors, can reduce the apparent impacts of pollution in surface waters by using and stabilizing nutrients. In a nutshell, nutrients from manure may be quickly washed downstream or taken up by plants in or near the stream. But ground water usually lacks living organisms which can use nutrients, and the impact of climatic factors is fairly minimal, resulting in significant longevity of pollutants in groundwater systems. Pollutants in ground water usually don't go away quickly, and the effects are harder to see. Most people don't know that some



USDA SCS Agricultural Waste Management Field Handbook Part 651. April 1992.

pollutants can travel more than a mile and show up as a problem for your neighbor. The old notion that movement of water a short distance down a stream or through the ground for 100' cleans and purifies it just doesn't hold water.

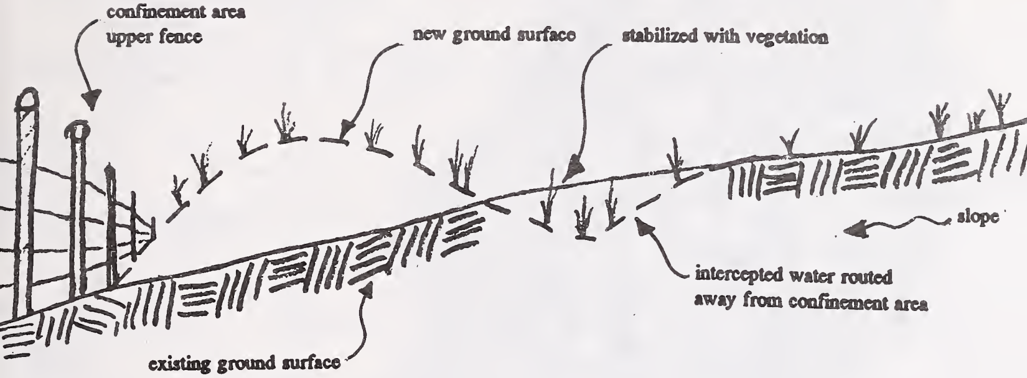
THE LAW

A permit which regulates runoff and/or infiltration may be required to legally operate your facility. It can be confusing because of the many variables found in different parts of the state. If you meet the definition of a CAFO or have been designated as a CAFO by the department following a site inspection and have a direct or **potential** discharge of pollutants to state waters, your operation is required to obtain authorization to discharge under a MPDES permit. This permit is typically required if your confinement area is occupied a total of 45 days or more per year, devoid of vegetation due to trampling and consumption, requires supplemental feeding, and discharges or potentially discharges pollutants to state waters. The permitted discharge to surface water resulting from a 25 year-24 hour rainfall event or larger is not considered pollution under the law. **All other**

I.

ABOVE CONFINEMENT AREA

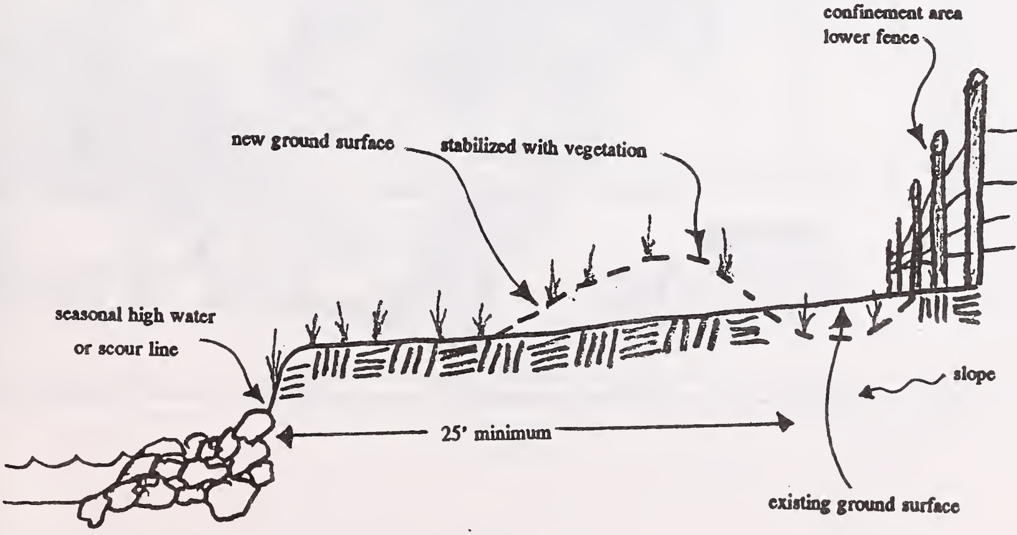
interception ditch collects clean run-off

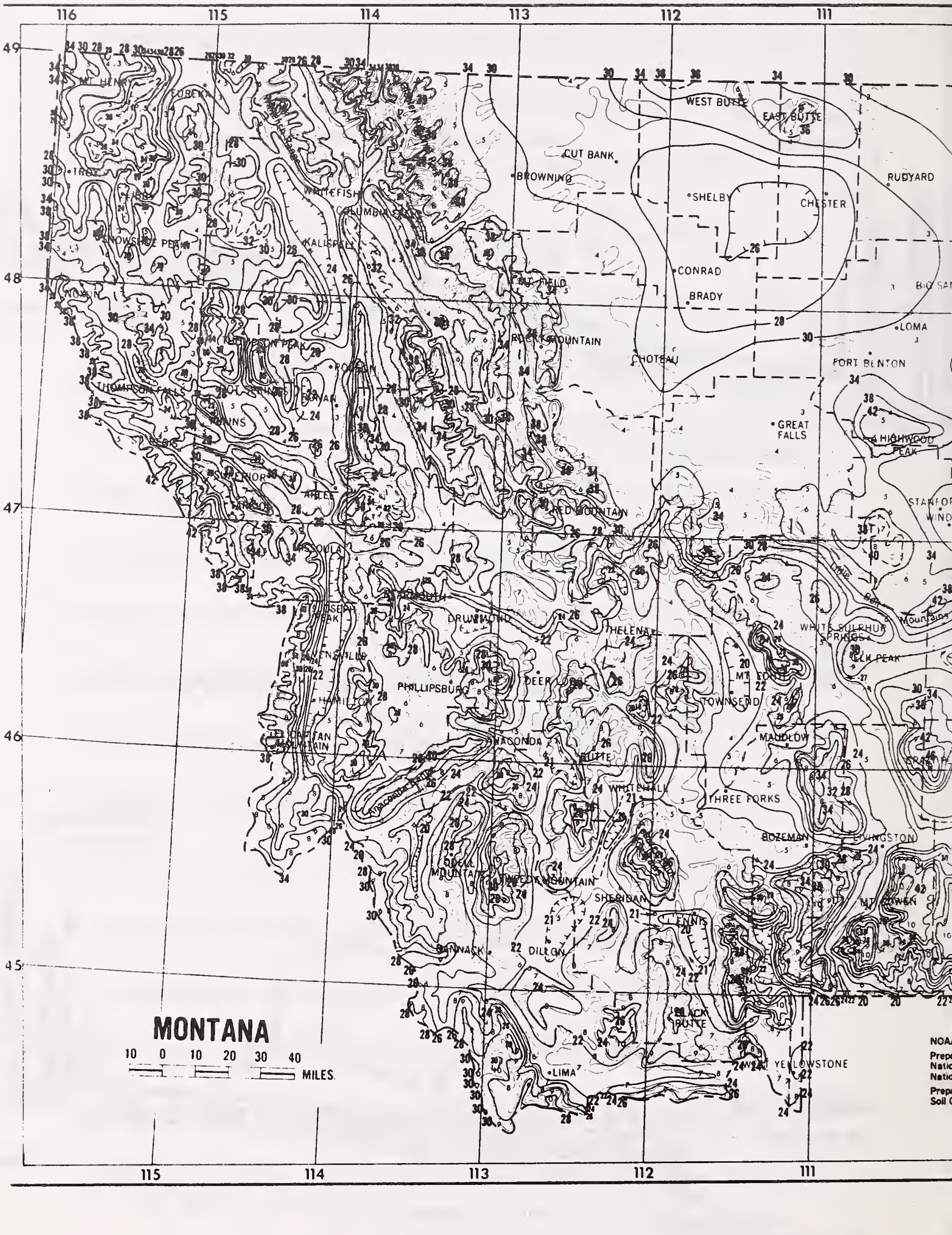

confinement area upper fence
new ground surface
stabilized with vegetation
slope
intercepted water routed away from confinement area
existing ground surface

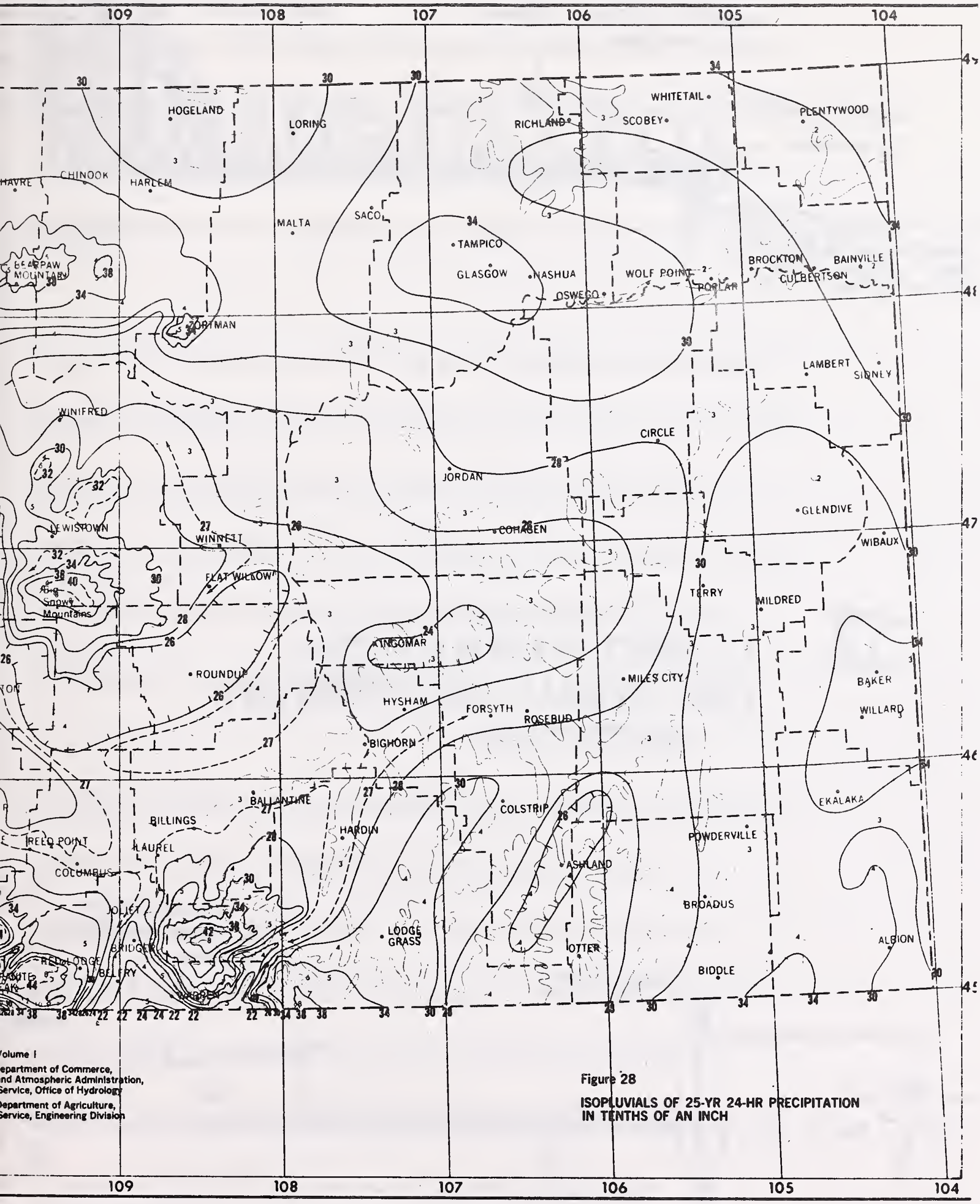
II.

BELOW CONFINEMENT AREA

intercepted run-off may be high in nutrients and sediments. Direct to vegetated area away from all surface water and high ground water areas


confinement area lower fence
new ground surface
stabilized with vegetation
seasonal high water or scour line
slope
25' minimum
existing ground surface


MONTANA
10 0 10 20 30 40 MILES
116
115
114
113
112
111
49
48
47
46
45
MT HENRY
EUREKA
TROY
SNOWSHOE PEAK
WHITEFISH
COLUMBIA FALLS
KALISPELL
CUT BANK
BROWNING
WEST BUTTE
EAST BUTTE
SHELBY
CHESTER
RUDYARD
CONRAD
BRADY
CHOTEAU
FORT BENTON
LOMA
GREAT FALLS
HIGHWOOD PEAK
ROCKY MOUNTAIN
POLSON
THOMPSON FALLS
HOT SPRINGS
PLAINS
RONAN
SUPERIOR
ARLEE
MISSOULA
RED MOUNTAIN
ST JOSEPH PEAK
DRUMMOND
HELENA
WHITE SULPHUR SPRINGS
ELK PEAK
Little Belt Mountains
STEVENSVILLE
HAMILTON
PHILLIPSBURG
DEER LODGE
TOWNSEND
MT EDITH
MAUDLOW
TRAPPER PEAK
ANACONDA
BUTTE
WHITEHALL
THREE FORKS
BOZEMAN
LIVINGSTON
MT BOWEN
TWEEDY MOUNTAIN
SHERIDAN
ENNIS
BANNACK
DILLON
BLACK BUTTE
WEST YELLOWSTONE
LIMA

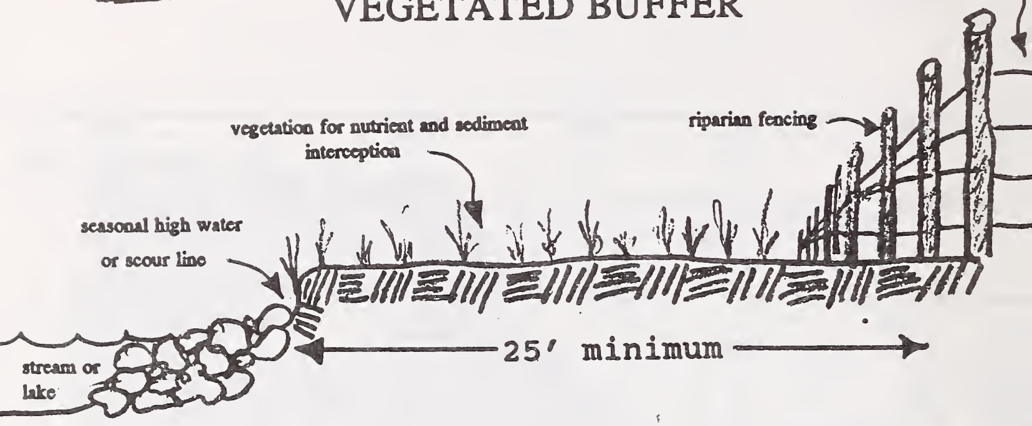


Volume I
Department of Commerce,
and Atmospheric Administration,
Service, Office of Hydrology
Department of Agriculture,
Service, Engineering Division

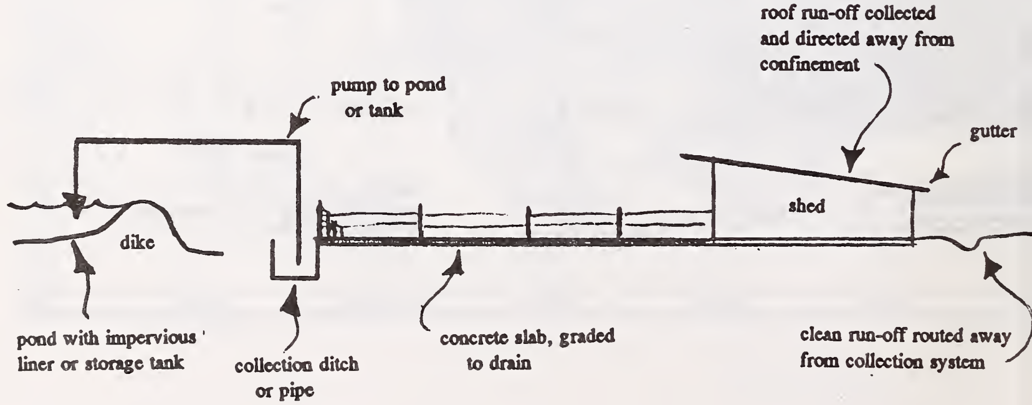
Figure 28

ISOPLUVIALS OF 25-YR 24-HR PRECIPITATION IN TENTHS OF AN INCH

III. VEGETATED BUFFER


confinement area
vegetation for nutrient and sediment interception
riparian fencing
seasonal high water or scour line
stream or lake
25′ minimum

IV. CLOSED WASTE SYSTEM FOR ANIMAL CONFINEMENT FACILITIES


roof run-off collected and directed away from confinement
pump to pond or tank
gutter
shed
dike
pond with impervious liner or storage tank
collection ditch or pipe
concrete slab, graded to drain
clean run-off routed away from collection system

runoff or infiltration must be prevented from entering state waters. Allowing pollutants to enter state waters from anything smaller than the 25 year-24 hour rainfall event is a violation of the permit parameters and the WQA.

You should understand that the authorization to discharge under a MPDES permit only allows you to let contaminated water or runoff enter state waters during a very large or intense rainfall known as the 25 year-24 hour event. It is not an authorization or permit that generally allows you to discharge to or pollute state waters.

The MPDES permit also basically requires that you contain pollutants to prevent degradation of ground water. If conditions on your site appear conducive to pollution of ground water, application for the permit may be required. Information submitted by the applicant will enable the department to determine if a permit is required based on site conditions and the likelihood of causing significant degradation of ground water.

You may also be subject to regulation under the WQA even if you do not meet the definition of a CAFO if you confine livestock where surface runoff or infiltration may potentially enter state waters. *The typical winter feeding area, calving area, holding pens, or any area where you concentrate animals may be placing wastes in a location likely to pollute state waters. Using manure and bedding material for irrigation system dikes or diversions typically places wastes in a location likely to pollute state waters.* Section 75-5-605(1)(a) MCA of the Montana Water Quality Act states that **it is unlawful to cause pollution of any state waters or place or cause to be placed any wastes in a location where they are likely to cause pollution of any state waters.** This situation may require that you install WQPPs to prevent the risk of pollutants entering state waters. If WQPPs cannot prevent pollutants from entering state waters, it may be necessary to collect all wastes in a closed waste system or relocate the animal confinement area.

The WQA provides for civil penalties of up to $25,000 per day of documented violation. Willful or negligent violation may be a criminal offense resulting in possible penalties of up to $50,000 per day of violation and imprisonment.

WATER QUALITY PROTECTION PRACTICES

The WQPPs described below have been used successfully on other sites. Not all WQPPs will work on all sites. The extreme range of conditions found around the state prevent generic application of WQPPs, so this list is not inclusive. Refer to Appendix A for technical assistance contacts.

WATER MANAGEMENT

The movement of water into any site can usually be controlled to insure that uncontaminated runoff water does not contact pollutants and become contaminated. Installation of **GUTTERS** (see diagram IV) on loafing sheds and buildings, **INTERCEPTOR DITCHES, GRADE MODIFICATIONS** (diagram I), and even **VEGETATED BERMS** can be used to direct clean runoff water around a contaminated site instead of through it and reduce the volume of contaminated runoff to be managed.

WATER GAPS

SUPPLIED WATER or creation of **WATER GAPS** in conjunction with **RIPARIAN FENCING** (diagram III) can be used to limit animal access to state waters. Successful riparian fencing requires the creation of a **VEGETATED BUFFER** (diagram III) at least 25 feet wide between the fence and the average high water mark of the stream. Sloped sites require the installation of an **INTERCEPTION BERM or WALL** (diagram II) on the stream side of the riparian fence. Sites with slopes in excess of 15% usually cannot use these WQPPs due to high runoff velocities. Interception berms do not work on permeable or porous soils in areas with ground water within 25' of the surface due to rapid infiltration and possible ground water contamination.

CLOSED WASTE SYSTEM

An intensive waste management system can be developed to prevent contamination of state waters. In areas of high ground water or porous soils, an **IMPERVIOUS SURFACE** (diagram IV) is installed with a passive or active waste collection system built in. All waste is directed to a **STORAGE FACILITY** such as a lined pond or tank. The stored waste is land applied at agronomic rates during the growing season.

SUMMARY

Animal confinement operations are subject to regulation under the Montana Water Quality Act if the operation either meets the definition of a discharging CAFO or causes the placement of wastes in a location likely to pollute state waters. The operation must be managed in a manner that prevents the movement of pollutants or wastes to state waters (surface or ground waters). This can be accomplished through the use of Water Quality Protection Practices (WQPPs). Sites that use WQPPs which are properly managed but cannot contain all runoff water of a 25 year-24 hour rainfall event or larger must obtain a MPDES permit. The holder of the permit is assured that such a discharge is not a violation of the Montana Water Quality Act. Discharges of contaminated water caused by such things as smaller rainfall events, snowmelt or stock tank overflow through a feedlot is in violation of the permit and the Montana Water Quality Act.

Remember: the WQPPs described in this handbook are not all-inclusive and may not be applicable to all sites.

A MGWPCS permit may be required for any operation which may discharge pollutants to ground water. For example, a MGWPCS permit may be required for any operation located in an area with high ground water and/or permeable soils close to the surface. A MGWPCS permit may be required for land application sites and waste storage facilities. As noted earlier, this permit requirement is very site dependent.

STREAM PERMITTING IN MONTANA

MONTANA POLLUTION DISCHARGE ELIMINATION SYSTEM (MPDES)

Applies to all potential discharges to surface waters.
Process period up to 180 days.
Includes CAFO permits and Stormwater Runoff permits.

MONTANA GROUND WATER POLLUTION CONTROL SYSTEM (MGWPCS)

Applies to all potential discharges to ground waters.
Process period up to 180 days.
May be needed for waste storage facilities and land application sites.

3A AUTHORIZATION

Necessary for short-term exceedance of water quality standards. Usually issued for turbidity increases caused by streambank work or culvert/bridge installations but also required for aquatic pesticide applications.

Contact:

Montana Department of Health and Environmental Sciences
Water Quality Division
Cogswell Building
Capitol Station
Helena, MT 59620-0901
444-2406

310 PERMIT

Applies to all perennial streambank/streambed work.
Issued by local conservation district.
Process period up to 60 days.

Contact:

Local Conservation District

404 PERMIT

Required for placement of dredge or fill-in navigable waters or wetlands.
Process period up to 90 days.

Contact:

U.S. Army Corps of Engineers
Department of Natural Resources and Conservation
Metcalf Building
Helena, MT 59620
444-6670

FLOODPLAIN DEVELOPMENT PERMIT

Applies to development within designated floodplains.
Issued by local floodplain administrator or DNRC.

Process period up to 60 days.

Contact:

Local government or
Montana Department of Natural Resources and
Conservation
Floodplain Section
Metcalf Building
Helena, MT 59620
444-6654

LAKESHORE DEVELOPMENT PERMIT

Applies to development on lakes where local government has adopted regulations.
Process period up to 60 days.

Contact:

Local government

APPENDIX A: OTHER SOURCES OF INFORMATION

WHO	WHERE	WHAT
Conservation District	local government	erosion control, conservation plans, Streambed and Land Preservation Act

WHO	**WHERE**	**WHAT**
MDHES Water Quality Division	444-2406	water quality issues, MDPES & MGWPCS permits
MSU Extension	local government	general consultation on all phases of agriculture and livestock production
U.S. Department Agriculture, Soil Conservation Service	local government	technical assistance to agriculture producers
U.S. Forest Service and Bureau of Land Management	local government	information concerning and grazing and watershed management
Montana Department of Natural Resources and Conservation	444-6601	water rights, water planning and floodplain management
Montana Department of State Lands	444-2074	mining permits (gravel pits), timber harvest and SMZ

BIBLIOGRAPHY

75-5-101, MCA, *et.seq.*	Montana Water Quality Act
ARM 16.20.601 *et.seq.*	Surface Water Quality Standards
ARM 16.20.1001 *et.seq.*	Ground Water Quality Standards

USDA/SCS Agricultural Waste Management Field Handbook, April 1992

Life experience and common sense

§ 122.23 Concentrated animal feeding operations (applicable to State NPDES programs, see § 123.25).

(a) *Permit requirement.* Concentrated animal feeding operations are point sources subject to the NPDES permit program.

(b) *Definitions.* (1) "Animal feeding operation" means a lot or facility (other than an aquatic animal production facility) where the following conditions are met:

(i) Animals (other than aquatic animals) have been, are, or will be stabled or confined and fed or maintained for a total of 45 days or more in any 12-month period, and

(ii) Crops, vegetation forage growth, or post-harvest residues are not sustained in the normal growing season over any portion of the lot or facility.

(2) Two or more animal feeding operations under common ownership are considered, for the purposes of these regulations, to be a single animal feeding operation if they adjoin each other or if they use a common area or system for the disposal of wastes.

(3) "Concentrated animal feeding operation" means an "animal feeding operation" which meets the criteria in appendix B of this part, or which the Director designates under paragraph (c) of this section.

(c) *Case-by-case designation of concentrated animal feeding operations.* (1) The Director may designate any animal feeding operation as a concentrated animal feeding operation upon determining that it is a significant contributor of pollution to the waters of the United States. In making this designation the Director shall consider the following factors:

(i) The size of the animal feeding operation and the amount of wastes reaching waters of the United States;

(ii) The location of the animal feeding operation relative to waters of the United States;

(iii) The means of conveyance of animal wastes and process waste waters into waters of the United States;

(iv) The slope, vegetation, rainfall, and other factors affecting the likelihood or frequency of discharge of animal wastes and process waste waters into waters of the United States; and

(v) Other relevant factors.

(2) No animal feeding operation with less than the numbers of animals set forth in appendix B of this part shall be designated as a concentrated animal feeding operation unless:

(i) Pollutants are discharged into waters of the United States through a manmade ditch, flushing system, or other similar manmade device; or

(ii) Pollutants are discharged directly into waters of the United States which originate outside of the facility and pass over, across, or through the facility or otherwise come into direct contact with the animals confined in the operation.

(3) A permit application shall not be required from a concentrated animal feeding operation designated under this paragraph until the Director has conducted an on-site inspection of the operation and determined that the operation should and could be regulated under the permit program.

APPENDIX B TO PART 122—CRITERIA FOR DETERMINING A CONCENTRATED ANIMAL FEEDING OPERATION (§ 122.23)

An animal feeding operation is a concentrated animal feeding operation for purposes of § 122.23 if either of the following criteria are met.

(a) More than the numbers of animals specified in any of the following categories are confined:

(1) 1,000 slaughter and feeder cattle,
(2) 700 mature dairy cattle (whether milked or dry cows),
(3) 2,500 swine each weighing over 25 kilograms (approximately 55 pounds),
(4) 500 horses,
(5) 10,000 sheep or lambs,
(6) 55,000 turkeys,
(7) 100,000 laying hens or broilers (if the facility has continuous overflow watering),
(8) 30,000 laying hens or broilers (if the facility has a liquid manure system),
(9) 5,000 ducks, or
(10) 1,000 animal units; or

(b) More than the following number and types of animals are confined:

(1) 300 slaughter or feeder cattle,
(2) 200 mature dairy cattle (whether milked or dry cows),
(3) 750 swine each weighing over 25 kilograms (approximately 55 pounds),
(4) 150 horses,
(5) 3,000 sheep or lambs,
(6) 16,500 turkeys,
(7) 30,000 laying hens or broilers (if the facility has continuous overflow watering),
(8) 9,000 laying hens or broilers (if the facility has a liquid manure handling system),
(9) 1,500 ducks, or
(10) 300 animal units;

and either one of the following conditions are met: pollutants are discharged into navigable waters through a manmade ditch, flushing system or other similar man-made device; or pollutants are discharged directly into waters of the United States which originate outside of and pass over, across, or through the facility or otherwise come into direct contact with the animals confined in the operation.

Provided, however, that no animal feeding operation is a concentrated animal feeding operation as defined above if such animal feeding operation discharges only in the event of a 25 year, 24-hour storm event.

The term "animal unit" means a unit of measurement for any animal feeding operation calculated by adding the following numbers: the number of slaughter and feeder cattle multiplied by 1.0, plus the number of mature dairy cattle multiplied by 1.4, plus the number of swine weighing over 25 kilograms (approximately 55 pounds) multiplied by 0.4, plus the number of sheep multiplied by 0.1, plus the number of horses multiplied by 2.0.

The term "manmade" means constructed by man and used for the purpose of transporting wastes.

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